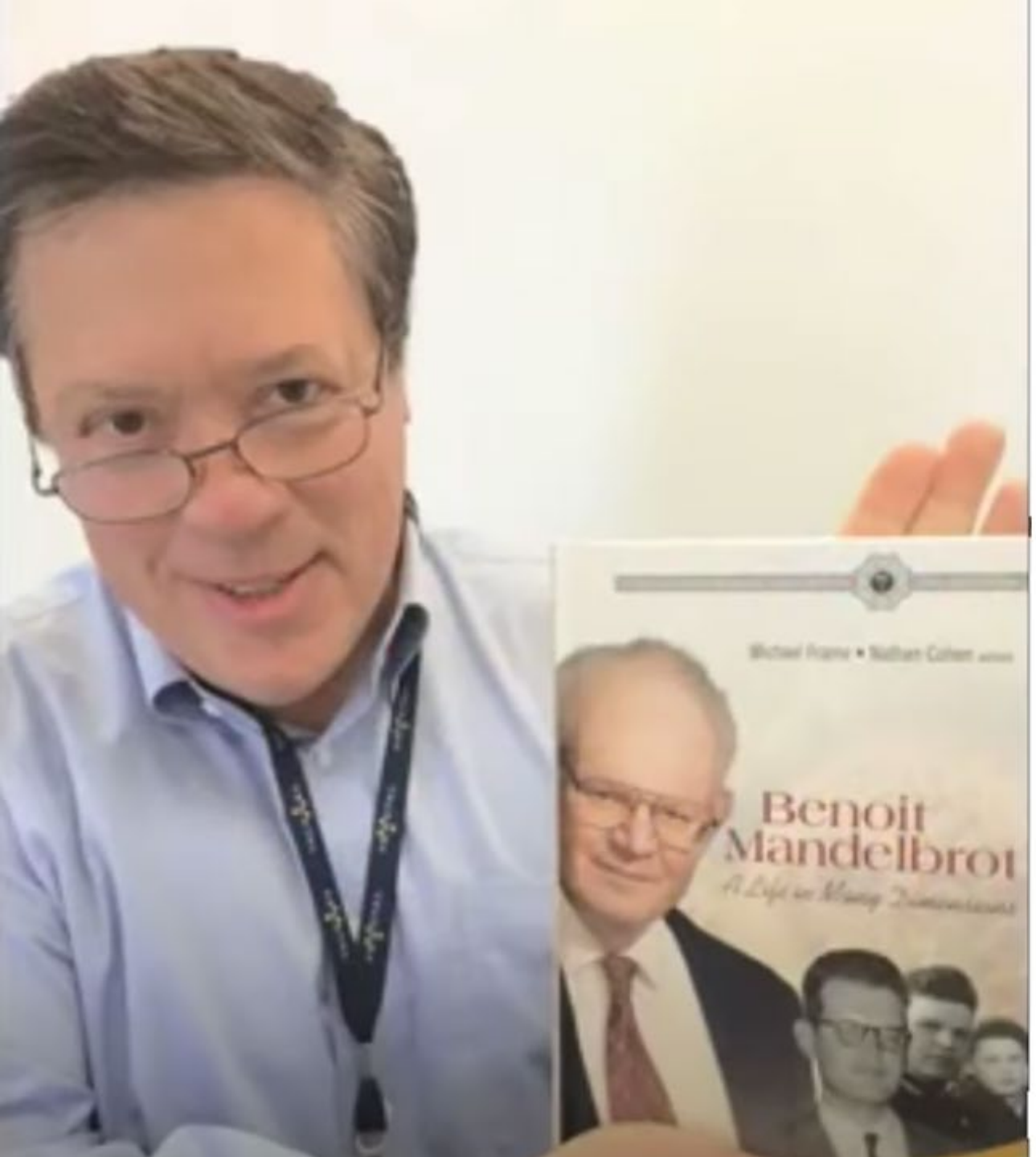
The Fractal Antenna

Miracle or Myth ?

w6nbc.com/slides?



Nathan Cohen

Fractal Inventor

United States Patent US 7,256,751 B2
Cohen *Aug. 14, 2007

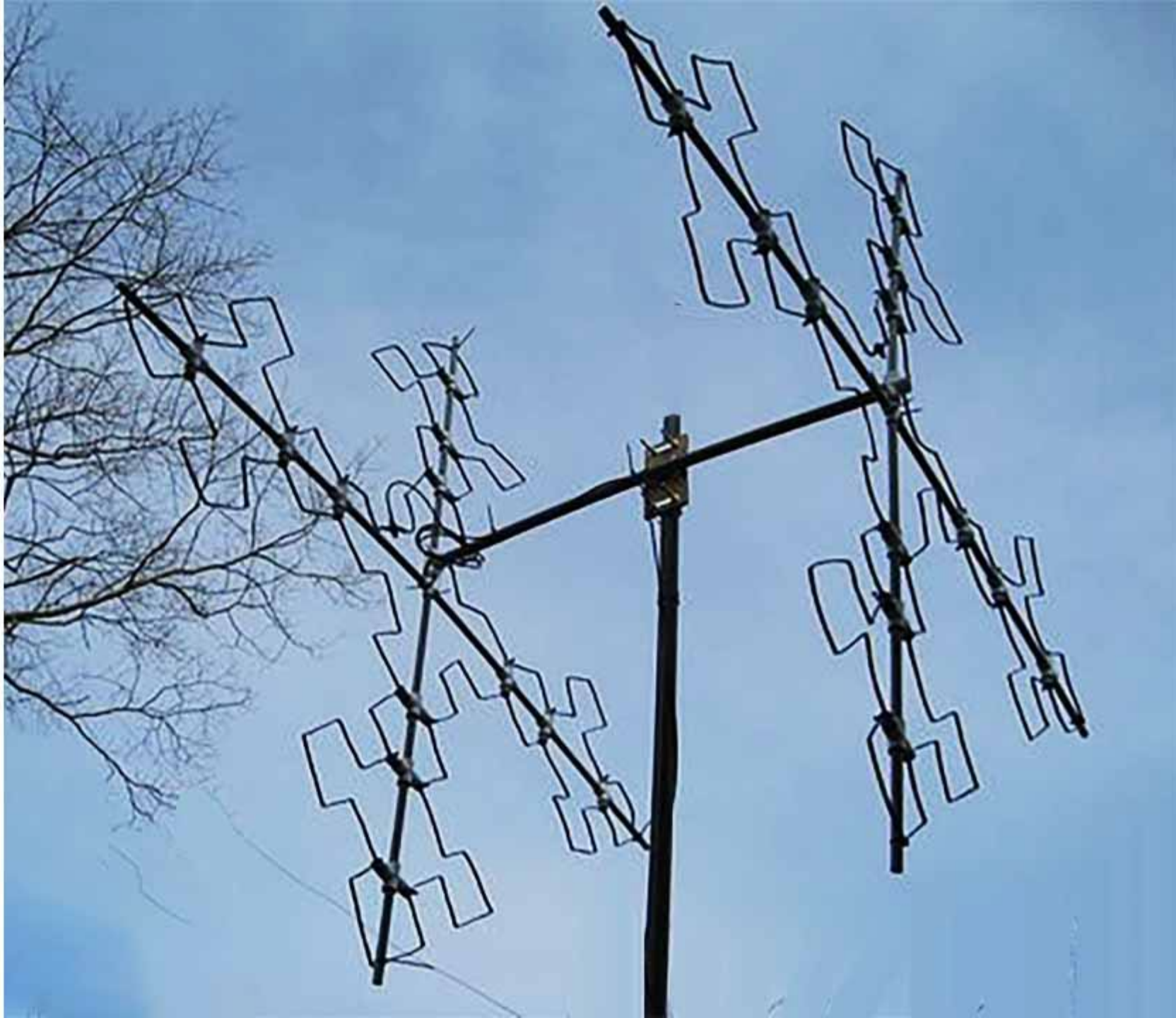
Validly Defends Fractals

https://www.youtube.com/watch?v=6pRhGTD4caE

Even if NOT a Myth

Hams are still Uncertain

Is this → Worth Doing

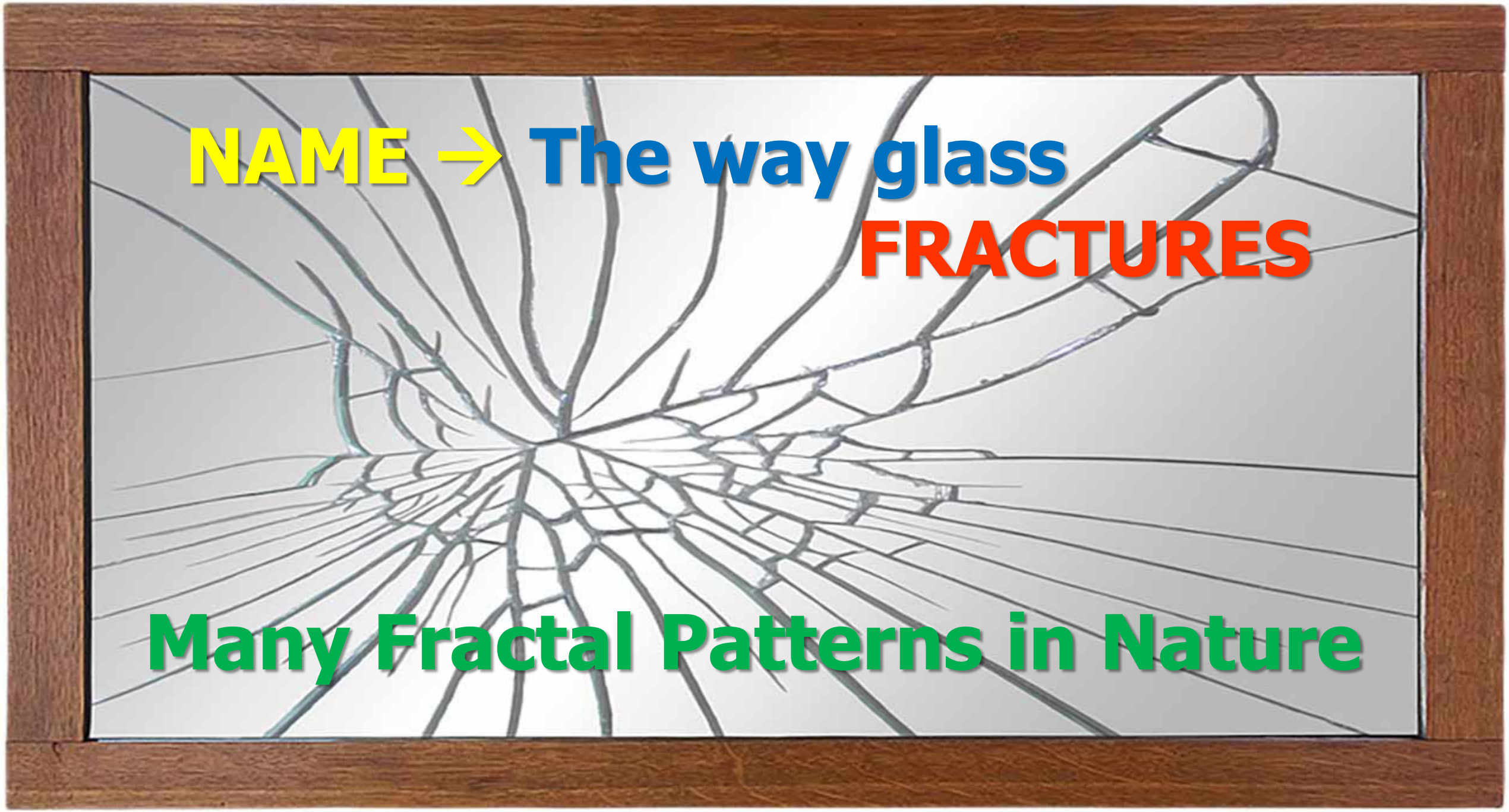


What are Fractals ?
How are They Used in Technology ?

BIO-MIMICRY

Using Patterns in nature to improve technology

E.G. Ornithopter – mimick birds


NAME → The way glass
FRACTURES
Many Fractal Patterns in Nature

Snowflake Fractal

Koch Fractal

Canyons

COASTLINES

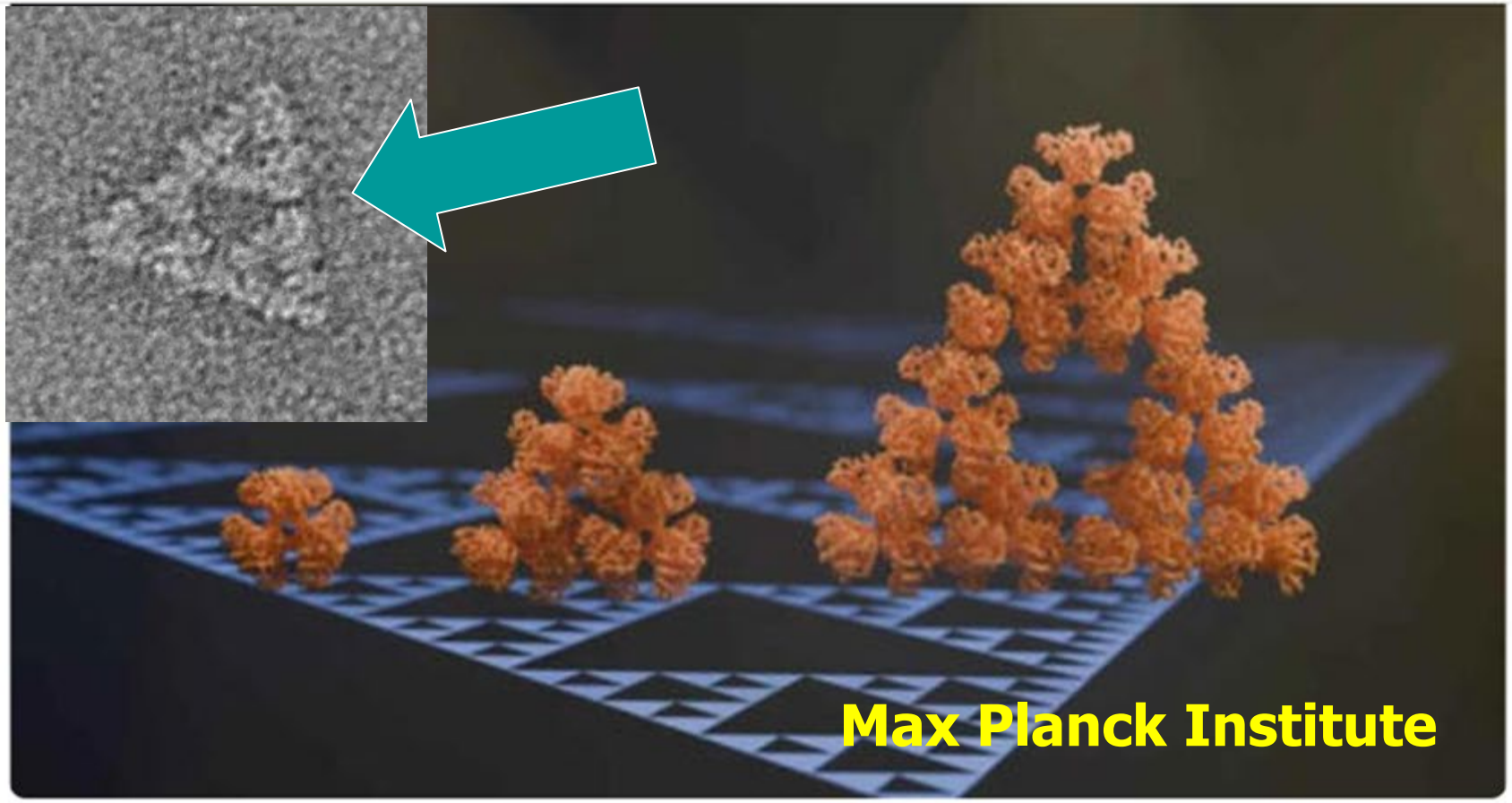
Biological Fractals

Tree Branches

London, Rome

Phoenix AZ

This is the first fractal molecule in nature

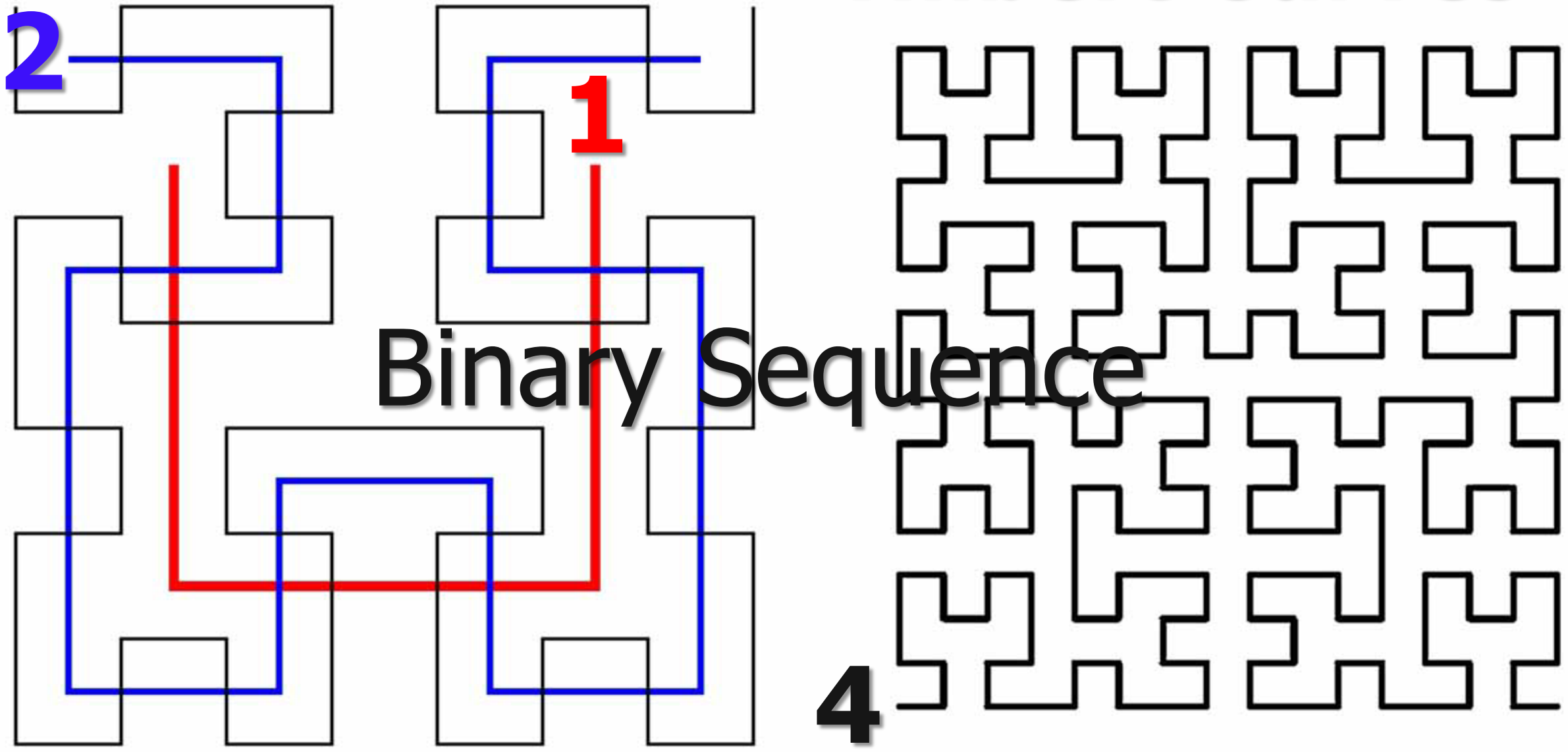


The citrate synthase protein self-assembles in a Sierpiński Triangle fractal pattern.
Credit: MPI f. Terrestrial Microbiology/ Hochberg.

Mathematical Space Filling Curves

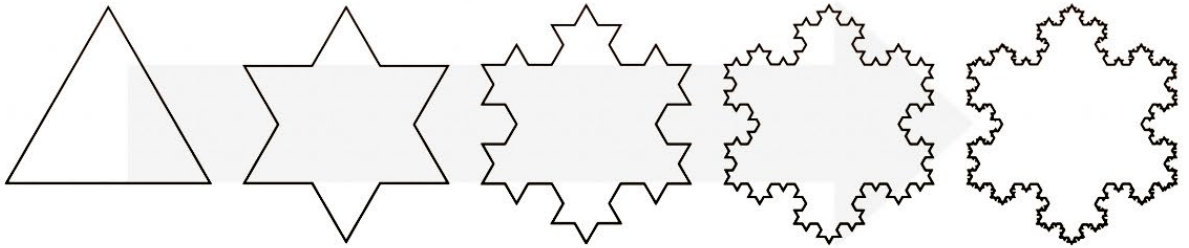
- Fills the space most efficiently
- As you zoom in, the same shape repeats

Hilbert Curves

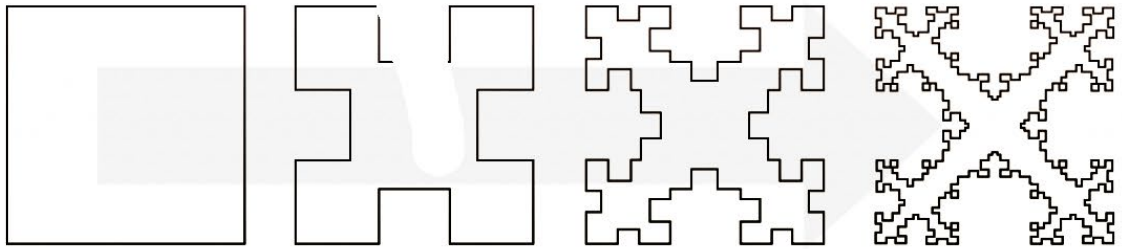


Other Fractal Patterns

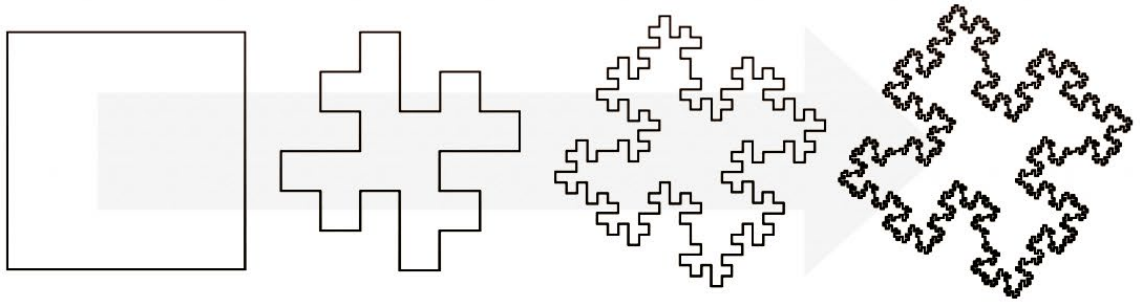
SIERPINSKI GASKET/TRIANGLE FRACTAL



KOCH SNOWFLAKE FRACTAL



MINKOWSKI ISLAND FRACTAL



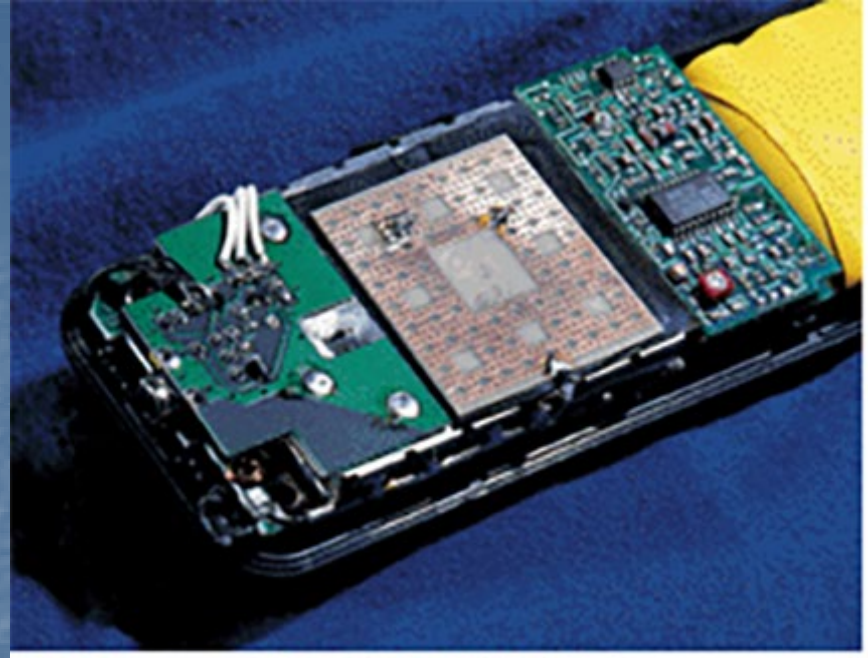
QUADRATIC KOCH ISLAND/MINKOWSKI FRACTAL

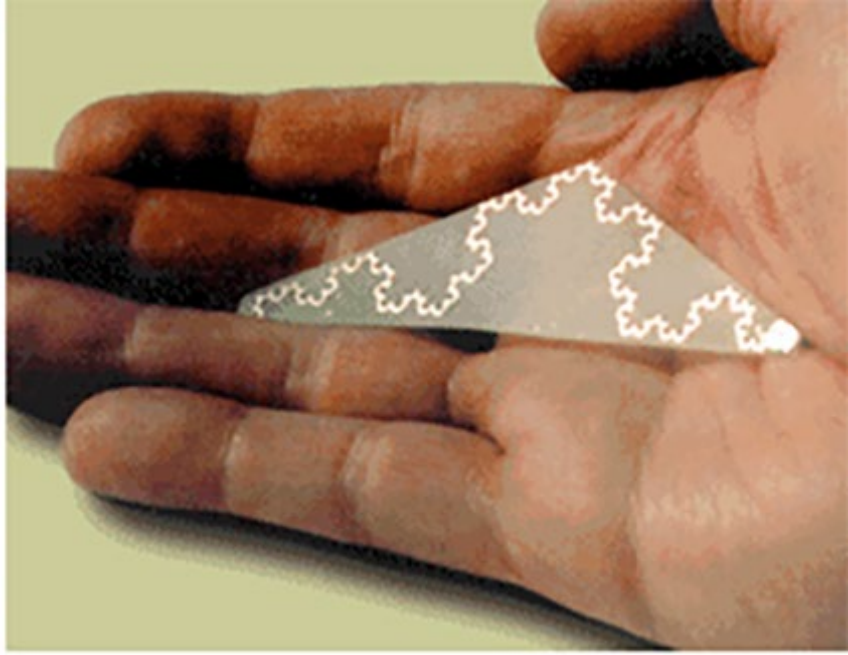
Value of Fractals in Antennas

Advantages

- Smaller Size
- Greater Bandwidth

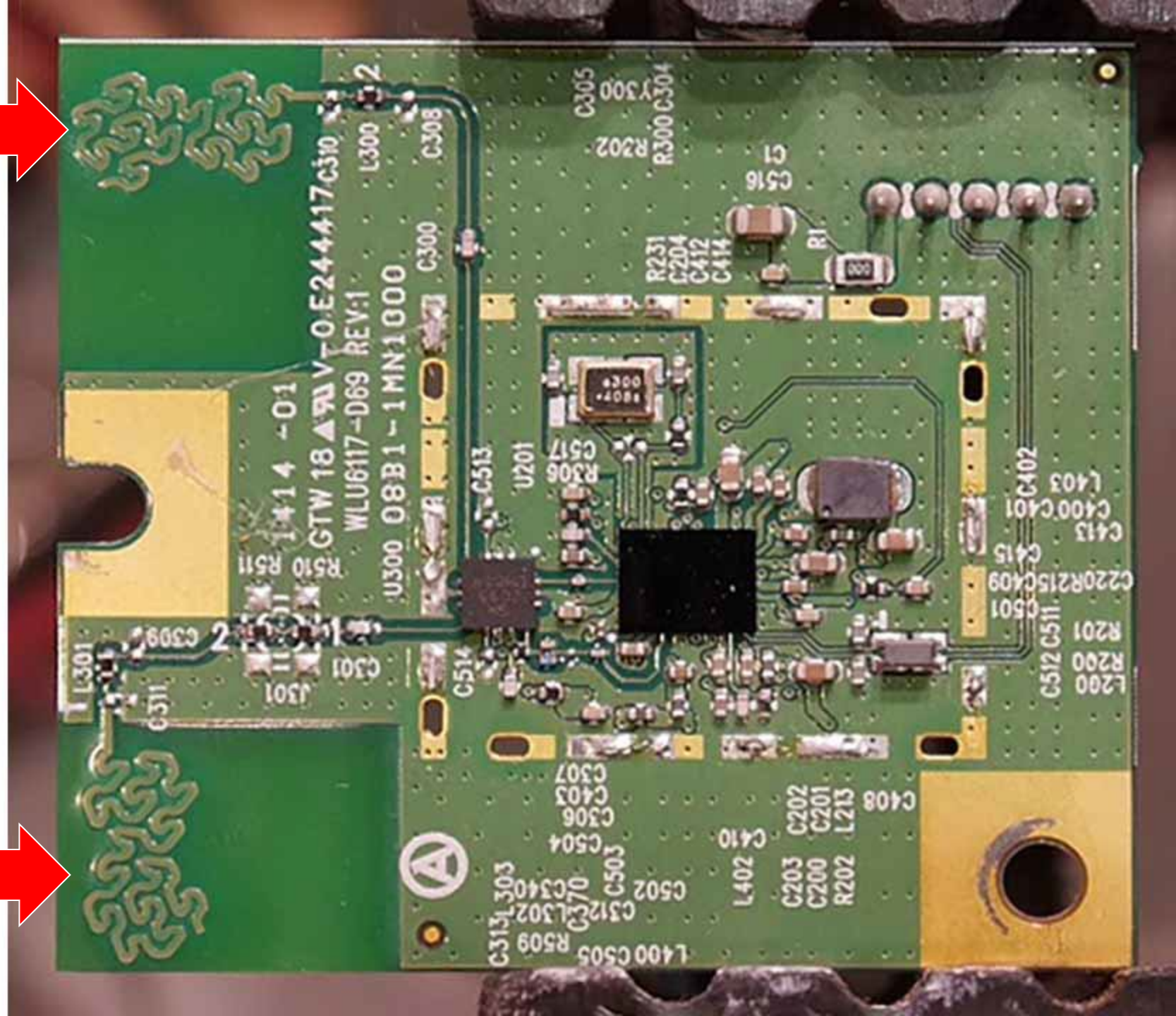
Hilbert Sirpinski Mandelbrot Fractal Antennas for Cell Phones Laptops





PCB

Fractal Cell Phone Antennas

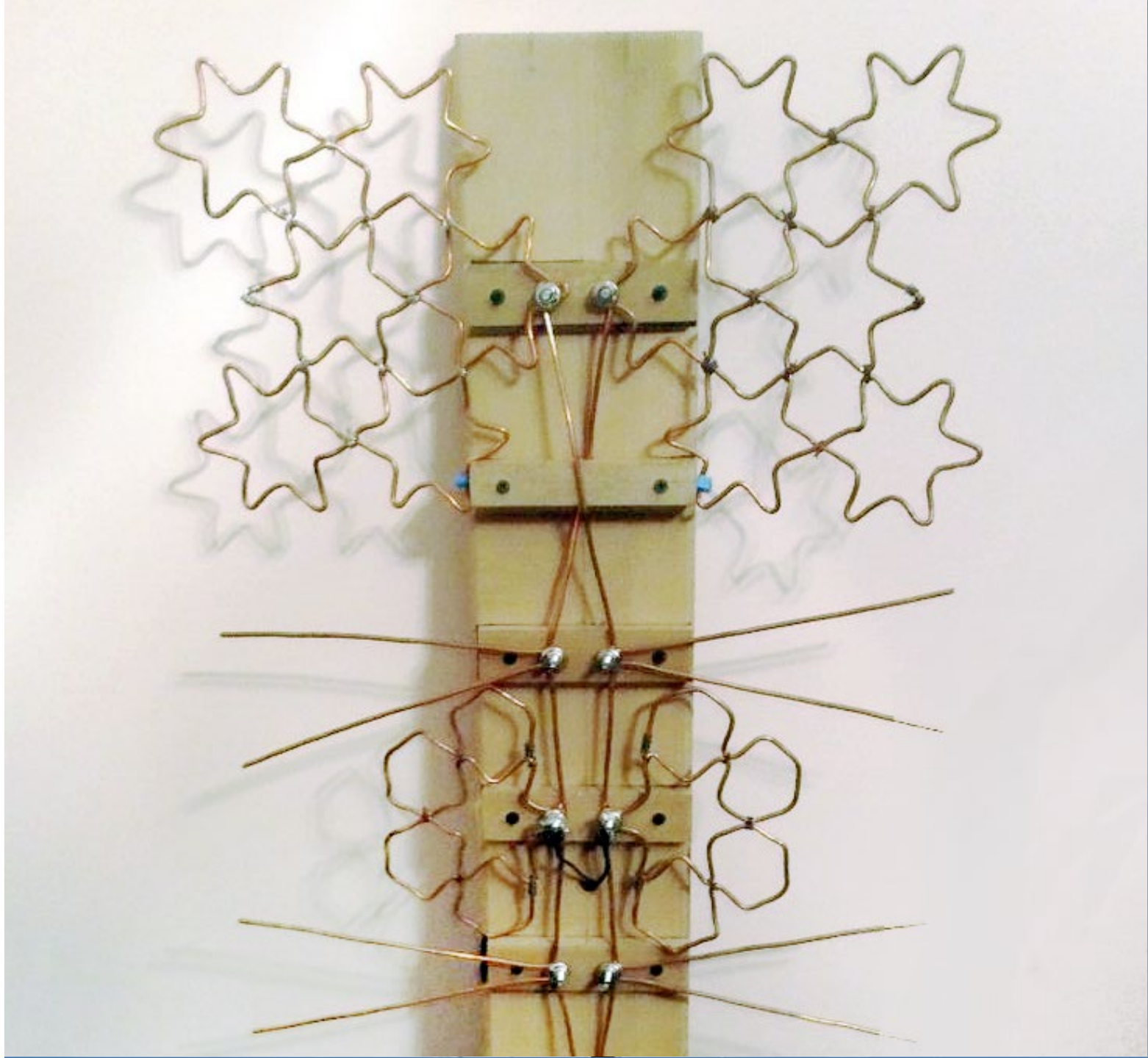


BUT are Fractals Useful for Ham Antennas ?

Many have tried

So why haven't we heard?

My feeling WHY NOT?



Reason One

Fractal antennas are mechanically difficult to build (except on PC board)

Is Mother Nature always the best way?

Who wants a bouncing fuselage?

Ornithopters Are Impractical

My Attempt 1 Fractal Garden Trellis

Aluminum tape, wire woven in, nails, screws?

IMPRACTICAL

My Attempt 2
Pegboard
SAME – IMPRACTICAL

Reason Two

ONLY SLIGHTLY MORE EFFICIENT than loading coils or other size reducing methods

On the order of 14%

For Ham Radio

Leave fractals to the cellphone designers

w6nbcmail
@gmail.com

w6nbc.com/
slides